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CHAPTER 9
INTEGRATED DISCUSSION

9.1 Introduction

There are little other areas within South Africa with comparable attributes and potential for conservation like the Waterberg. Most other areas have constraints in one form or another. Most importantly the Waterberg is vast, unexplored and largely unknown, and should meet the growing needs of a certain sector of the tourism industry. A further advantage is that the Waterberg enjoys close proximity to the metropolitan area of Gauteng, there is no Malaria, and it has the capacity to develop an excellent infrastructure, which should cater for the needs of the discerning tourist (Walker, 2000). The vastness and new developments within the area further provide many opportunities for research in the ecological field and it was indeed the lack of ecological data on the vegetation, birds and mammals, and the many new tourism developments that initiated this project. The fact that ecotourism plays an increasingly important role as a tool to initiate conservation also contributed to the motivation behind this project. Both ecological aspects and aspects concerning ecotourist activities relating to ecology, were addressed and the one main conclusion was that the vegetation in the Biosphere Reserve should be considered as the basis of all further detailed ecological investigations within ecosystems and also for ecological management strategies. A summary of findings and conclusions drawn from the previous chapters are presented in the following section as an "Integrated Discussion" on the Waterberg Biosphere Reserve and its natural resources as tourist attractions.

9.2. Plant Community Classification

9.2.1 Methodological approach

The classification of the major plant communities in the Biosphere Reserve is the first comprehensive overview classification of the Waterberg vegetation. Although a plantecological survey was done by Coetzee *et al.* (1981) in the Kransberg area of the Waterberg, no such formal classification has been done, although some classifications

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were previously performed locally on smaller reserves and game farms in the main Waterberg basin.

The method used for classification was somewhat different to the method proposed by Bredenkamp & Bezuidenhout (1995) for large vegetation datasets. In the classification of the Waterberg plant communities, the main aim was to identify diversity of plant communities, rather than the phytosociological synthesis approach used by Winterbach (1998) in parts of the study area. The method could provide the basis for future studies aimed at identifying vegetation diversity over large areas of southern Africa.

The main criteria for using the old datasets were that all of the localities had to be visited and all plant communities had to be identifyable visually. If necessary, field surveys were performed in areas where plant communities could not be identified clearly as well as in areas where no data were available. This method was found extremely successful in the Waterberg Biosphere Reserve. However, a good knowledge of the area (e. g. geology, geomorphological features, climate, soil, vegetation patterns and topography) is necessary. Werger (1974) emphasized that this kind of knowledge is a prerequisite for successful phytosociological studies.

9.2.2 The Plant Communities

The multivariate numerical classification and subsequent refinement by Braun-Blanquet methodology (Bredenkamp & Bezuidenhout, 1995) revealed 12 major plant communities from 1897 relevés of various datasets, supplemented from own field surveys, indicating the high diversity in vegetation patterns over an area of 150 000 hectare. The plant communities of the Waterberg Biosphere Reserve showed a strong correlation with environmental factors (Bredenkamp & Brown, 2001) in the diverse landscapes. The factors determining the occurrence of the major plant communities were altitude, aspects, geology and soils, geomorphology and climate.

Different plant communities were identified and these communities could provide useful information to reserve managers in the Biosphere Reserve concerning veld condition, grazing capacity, types of animals, numbers of animals and general veld

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management practice (Bothma, 2000). An interesting aspect found from the field surveys done in the mountainous terrain of the Wonderkop Nature Reserve, is the definite difference from the Moist Mountain Bushveld in the other mountainous parts of the Waterberg. A new vegetation type could possibly be classified in future, as Waterberg Arid Mountain Bushveld on Waterberg Sandstone (Mogalakwena and Makgabeng formations) in this area, as similarly found by Siebert (2001) in Sekhukuneland. The absence of typical Waterberg species like *Diplorhynchus condylocarpon* and *Englerophytum magalismontanum*, and presence of typical sweet, arid grass species on the rocky slopes (Waterberg Sandstone) motivated the thinking behind such a classification.

The plant communities furthermore provide an indication of the diversity of the vegetation within the Biosphere Reserve on a large scale and could be used as part of an ecological management plan using the ecozones as basis, for the Biosphere Reserve. Furthermore, the communities provide to tourists interested in botany and to reserve managers a broad-scale plant species composition. The ecological management plans for smaller properties should however still be done at a local scale, as they will need more intensive management than the broad Biosphere Reserve.

9.3 Ecozones

9.3.1 Methodological approach

The ecozones in the Biosphere Reserve were identified in a similar way as Gertenbach (1983) had done for the landscapes of the Kruger National Park. Gertenbach (1983) classified a landscape as an area with a specific geomorphology, macroclimate, soil, vegetation pattern and associated fauna. Most of these parameters were used for the Waterberg Biosphere Reserve, although the associated fauna was rather linked to the ecozones after their habitat classification. Although some heterogeneity does occur in certain ecozones identified in the Biosphere Reserve (due to the complex topography), the most dominant abiotic components were grouped together as relatively homogenous units in a specific area, similar to Gertenbach (1987). The criteria for identification were therefore that at least two specific environmental parameters had to be dominant over the area (e. g. geological

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formations, vegetation pattern and geomorphological features in the *Diplorhynchus-Burkea* Rolling Mountains Ecozone). The scale at which the individual plant communities were identified made the mapping of plant communities almost impossible, but the ecozone (landscapes) "approach" enabled the mapping of ecozones as management units.

9.3.2 Ecozones as management units for the Biosphere Reserve

Bredenkamp & Van Rooyen (1991) noted that individual plant communities and/or ecological related groups of plant communities could be used for the delimitation of management units. Van Staden (in prep.) classified the landscapes of the Marakele National Park as management units. The 6 ecozones identified in the Waterberg Biosphere Reserve can be compared to these landscapes (on a larger scale) and could be used as part of a Biosphere Reserve management plan. The management plan could incorporate all owners of major conservation areas (e. g. nature reserves, national parks etc.) and ecotourist destinations, as well as smaller game farmers. The management plan should incorporate a system where owners co-operate to initiate large scale ecological management for the following aspects:

- Fire
- Monitoring of veld condition
- Roads
- Fencing
- Water
- Exotic problem plants
- Erosion control

Van Staden (in prep.) emphasized these as important aspects for a management program. Owners still have the option to perform their own management programs on their properties if they wish to do so, and the management of a larger area (for example a homogenous plant community occurring over more than one property) is only recommended to optimize management of the Biosphere Reserve. This large-scale management could be beneficial for maintaining veld condition, biodiversity

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and relations between landowners. However, co-operation between landowners and workshop presentations informing them of the benefits of such a management program, are extremely important.

The ecozones are considered to be specifically useful as management units for ecotourist activities, and providing tourists with useful information on the area and its attractions (e. g. geology, mammals, birds, aesthetic), in accordance to the tourism booklet of the Kruger National Park (Jacana, 1997).

9.4 Trees, mammals and birds as tourist attractions

9.4.1 Methodological approach

1. Trees:

The method used to rank the different tree and shrub species according to their combined tourism value (calculated according to certain attributes) and frequency abundance (reduced synoptic table) within the major plant communities is a completely new approach. The method is useful in providing reserve managers with information on the value of a specific tree and shrub species, within plant communities of the Biosphere Reserve.

2. Larger Mammals and birds

The classification of the mammal and bird habitats was done solely based on habitat preferences of species associated with the major plant communities identified. Fairbanks *et al.* (2001) and Reyers *et al.* (2002) used quarter degree grid data to classify avifauna distribution and diversity of specific areas. However, the classification for the bird and mammal communities of Biosphere Reserve was done somewhat differently. The data from quarter degree grids were combined to create bird and mammal species lists. This was done since the classification of the bird and mammal lists in the quarter degree grids was thought not to be representative of species distribution and communities in the Biosphere Reserve, since a quarter degree grid might represent a high diversity of animal habitats. Instead, the species lists associated with the plant communities according to habitat preferences were classified

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by TWINSPAN analysis to indicate specific habitat types within which mammal or bird communities occur. These habitat types are associated with the plant communities which form a mosaic of vegetation types in the ecozones (landscapes), giving a good indication of where certain mammal or bird species can be found.

9.4.2 Habitat types of mammals and birds

The habitat classification of the mammal and bird habitats gives a definite indication of specific animal communities that occur in different combinations of plant communities. Species groups in the synoptic tables should be interpreted as bird or mammal communities associated with specific habitat types, according to their habitat preferences. Bird communities seem to be more defined, since individual species have narrower specialized niche habitats (Wiens, 1989), while mammals have a much broader habitat preference, often dependant on the availability of grazing or browsing material (Skinner & Smithers, 1990) in the Sour Bushveld Veld Type (Acocks, 1988) of the Waterberg. Predators and raptors on the other hand, are more dependent on the availability of prey species. The diverse landscapes (ecozones) with its vegetation patterns create many diverse habitat types to birds and mammals, ranging from forests, low lying dense to open woodlands, rocky mountain slopes, grasslands and open water wetlands. Furthermore, the added habitat of the old fields plant community increases the diversity of mammals and birds even further. The old fields not only provide grazing to many mammal species, but also provide an added habitat to mammals (e. g. blesbok, springbok) and birds (e. g. crowned plover, korhaans) which would not normally occur in the mountainous areas. Brawn *et al.* (2001) concluded from a study that these so-called degraded land, accounting for 11.81% in the savanna ecoregion of South Africa (Reyers, 2002), plays an important role in diversifying avifauna habitats, and the same could be said for cultivated fields and other disturbed habitats outside conservation areas in the buffer zone of the Biosphere Reserve.

9.4.3 Vegetation Ecology: The basis for interpreting ecosystems

Species exist in natural settings, within functioning communities and ecosystems, interacting with other species and the abiotic environment (Meffe & Carroll, 1997). It

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is fundamental that vegetation is always an integral part of an ecosystem and can only be studied by fully exploring its role within that system. In terrestrial ecosystems, vegetation supports the entire ecosystem by fixing light energy in manufacturing the organic food needed for energy flow through the system (Bredenkamp & Brown, 2001). In this study, it became clear that the vegetation of the Waterberg Biosphere Reserve plays an integral part in the functioning of the ecosystems, providing habitats to birds and mammal species and forming mosaics within landscapes (ecozones). The plant community may also serve as basis for ecological management plans (Bredenkamp & Brown, 2001) of locations in the Waterberg, although this aspect was not addressed in the study.

Vegetation structure seems to play an overwhelming role in providing animal species with shelter, nesting sites and food. The habitat preference of mammals and birds is often described as a specific vegetation structure, e. g. open woodland, short open grasslands etc. The different plant communities identified in the Waterberg all possessed a very distinct structure as classified by Edwards (1983). Therefore linking the mammals and bird habitat preferences with the distinct plant communities was relatively easy. However, the individual plant species composition of plant communities will also determine the grazing- and browsing capacity for mammal species, and the amount of food available to seed - and fruit-eating bird species.

The ecosystem of the Waterberg Biosphere Reserve and components thereof functioning as tourist attractions, can be interpreted as follows as shown in Figure 9.1:

- The 12 major plant communities identified, as the basis of ecosystems, form the habitat types for bird (7 habitats) and mammal species (5 habitats) present in the area as tourist attractions (e. g. game-viewing, bird watching activities).
- These plant communities have a certain plant species composition, of which there is a woody component (e. g. trees and shrubs as tourist attraction; browsing) and a herbaceous component (grasses, forbs as browsing / grazing).
- Different combinations of plant communities form part of specific ecozones (6 ecozones or landscapes) representing larger ecosystems, which possess aesthetic

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value, but also have the function as management units for a possible broad-scale management plan.

9.4.4 Natural resource ecotourist attractions in the Waterberg Biosphere reserve

The savanna region is the core of wildlife and ecotourism (Bredenkamp, 2002[a]), and the many ecotourist destinations such as Lapalala Wilderness, Entabeni Game Reserve, Shamabala Private Nature Reserve (Fig. 9.2), Welgevonden Game Reserve and Marakele National Park in the Waterberg Biosphere Reserve, provide tourists with the opportunity to explore the area with its diverse natural resource attractions. Some of these ecotourist destinations provide more for overseas visitors (e. g. Entabeni Game Reserve, Welgevonden Game Reserve) and corporate guests (e.g. many private lodges in the Welgevonden Nature Reserve and Shambala Private Nature Reserve have conference facilities), while others aim at the local market (e. g. Marakele National Park, Jobedi Game Lodge). The number of overseas visitors will largely depend on the presence of high profile species like members of the "big five" (lion, elephant, buffalo, rhinoceros and leopard), while smaller reserves like the Nylsvley Nature Reserve attract many local birders. Meffe & Carrol (1997) stated that natural sites supporting high profile species, or ecosystems with obvious public appeal are suitable for ecotourism and considering the presence of the "big five" and other larger mammal species, more than 400 bird species (including the largest colony of cape vultures in the world), diverse vegetation and aesthetic value of the mountainous regions, the potential of ecotourism in the Biosphere reserve is tremendous, although still being in a growing phase. The ecotourist destinations provide many activities to attract tourists, like game drives (night or day), walking safaris, fourwheel-drive safaris and many more. Considering that other aspects of the ecosystem, like reptiles and insects have not been included as possible tourist attractions, the potential for ecotourism in the Waterberg could be even higher.

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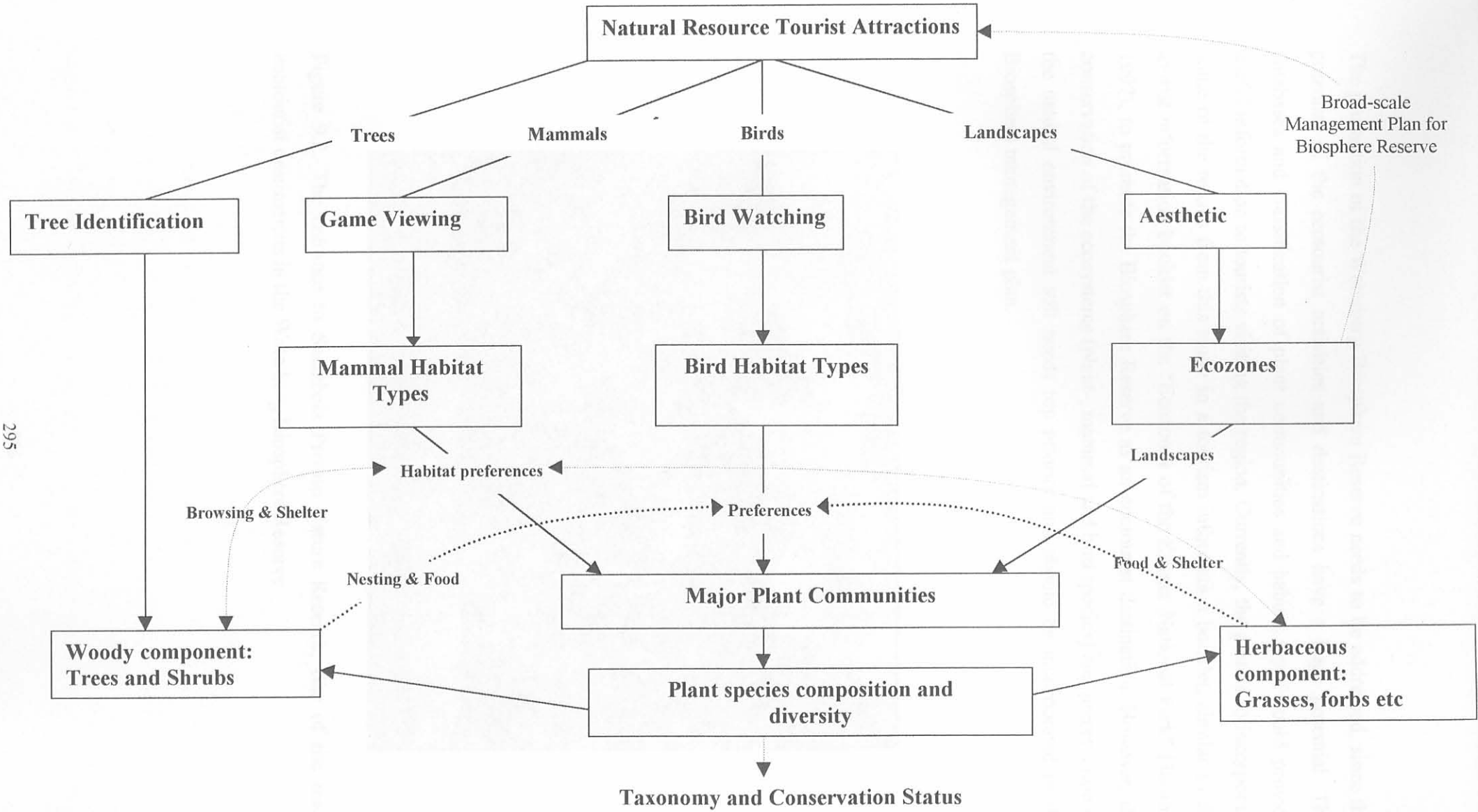

Figure 9.1 Tourist attactions of the Waterberg Biosphere Reserve and their ecosystem functions

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The promotion of the Waterberg Biosphere Reserve needs to be addressed, since the potential of the ecotourist activities and destinations have a huge potential. The databases and classification of plant communities and habitat types could provide useful information to tourists visiting the region. Currently, the plan is to incorporate some of the results from this study in a tourism information booklet, similar to the tourist information booklet on the "Ecozones of the Kruger National Park" (Jacana, 1997), to promote the Biosphere Reserve as an ecotourist destination. However, the conservation of the ecosystems (plant-, mammal and bird species) and preservation of the natural environment still needs top priority and should be incorporated in the Biosphere management plan.

Figure 9.2. The entrance to Shambala Private Nature Reserve, one of the many ecotourist destinations in the Waterberg Biosphere Reserve

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9.5 Ecotourism within the Waterberg Biosphere Reserve and its importance for conservation and sustainable development

Meffe & Carroll (1997) noted that nature tourism have many benefits such as ecosystem preservation, biodiversity conservation, education and research. The Waterberg Biosphere Reserve, with its many ecotourist destinations and great diversity (e. g. mammals, birds, plants) plays an important role in conservation, but also as an important source of public education [for example the outdoor classrooms at Lapalala Wilderness where more than 40 000 teachers and children passed through over the past 19 years (Walker, 2000)] and research. Although Isaacs (2000) describes ecotourism as a viable economic activity that can minimize negative human impacts on wildlife habitat and provide an incentive to protect natural areas, ecotourism is still unable to ensure long-term protection of species. He further noted that in certain aspects, the promotion of ecotourism might actually distract from more appropriate means of environmental protection. Therefore, the importance to have a proper management plan in place for the Biosphere Reserve cannot be over-emphasized. Management strategies should implement both ecological management plans and ecotourism management strategies. Klein *et al.* (1995) suggested that ecotourism should be held at acceptable levels and refuge managers should know which species are likely to be affected and which response occurs at different levels of disturbance. The importance of public education and changes in management practices was identified to reduce disturbance of waterbirds in Florida (U. S. A). Guided tours and low disturbance zones were identified as possible strategies to eliminate negative tourism impacts. To implement such management plans in the Biosphere Reserve, a thorough knowledge of the ecosystems of the area on a local, community and landscape level is essential.

The many rare and endangered bird and mammal species of the Waterberg Biosphere Reserve as tourist attractions, listed in the red data list (Hilton-Taylor, 2000), should definitely be prioritized as part of a conservation strategy. Furthermore, although the rare and endangered plant species have not been included in the study, the implementation of proper ecological management plans for the identified plant communities need to be implemented to ensure ecosystem preservation. The general conservation status of the bird, mammal and plant taxonomic groups in different

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ecoregions of South Africa, represented in the Biosphere Reserve, is included in Table 9.1. The ecoregions are represented in the following areas of the Waterberg Biosphere Reserve:

- Grassland Ecoregion: High Altitude Grasslands on the escarpment crest in Marakele National Park (>1800m)
- Forest Ecoregion: Kloofs, ravines and gorges in the Afromontane region of the escarpment in Marakele National Park and Entabeni Game Reserve
- Freshwater Ecoregion: Dams, pans, rivers, wetlands or any other water associated area within the Biosphere Reserve (e. g. Nylsvley Nature Reserve, Entabeni Game Reserve, Emaweni Game Lodge etc.)
- Savanna Ecoregion: All regions other than the areas described above

The authors referred to in Table 9.1 were the main contributors of information on the different taxonomic groups of organisms and the data were adapted from the information booklet on "The Biodiversity of South Africa 2002: Indicators, trends and Human Impacts". Although not all the species referred to in Table 9.1 are presented in the ecoregions of the Biosphere Reserve, it gives a good indication of the importance of conservation of sensitive areas within the ecoregions. Reyers *et al.* (2002) noted that existing complementary-based reserve selection techniques concerned with maximal biodiversity representation within minimum land-area do not necessary ensure long-term maintenance of biodiversity. However, the 150 000 hectares of land included in the Waterberg Biosphere Reserve, which include several conservation areas, represent most of the diversity that occurs throughout the area based on the diversity in plant communities, habitat types and ecozones (landscapes) identified within the Biosphere Reserve. This enhances the conservation of bird, mammal and plant species in the different ecoregions represented within the conservation areas.

Although conservation of natural resources within conservation areas of the Waterberg Biosphere Reserve needs top priority, local participation as part of sustainable development and ecotourism also needs to be implemented. Community initiatives such as the community participation program in the Wonderkop Nature Reserve, and the Masebe Nature Reserve as a communal (tribal) reserve within the

Biosphere Reserve are excellent examples of sustainable development. Other areas in the Biosphere Reserve, which could be included in such developments, include the Sterkrivier community and local communities of Thabazimbi and Vaalwater. Kellert (1986) stressed the importance of adequate public understanding of the values derived from the land protection in Biosphere Reserves, and ample opportunities of job creation, upliftment and resource development within the Waterberg Biosphere Reserve exist. Considering the statement by Homewood & Brockington (1999) that the conservation of an area relies increasingly on reserve-adjacent people, and on prioritizing the allocation of scarce resources, the Waterberg area, being rather unpopulated, is in the privileged position to provide for both the local communities, while conservation still receive top priority.

Table 9.1 Ecoregions of South Africa represented within the Biosphere Reserve and conservation status of mammals, birds and plants within them

	No. Species	No. Endemic Species	% Endemism	Critical	Endangered	Vulnerable
Savanna Ecoregion (Bredenkamp, 2002[a])						
Mammals (JH)	167	6	15%	2	2	9
Birds (JH)	532	8	15%	1	2	26
Plants (GB)	>5700	?	?	?	?	?
Grassland Ecoregion (Bredenkamp, 2002[b])						
Mammals (JH)	89	18	44%	0	1	8
Birds (JH)	349	31	58%	5	3	17
Plants (GB)	>3370	?	?	?	?	?
Forest Ecoregion (Lawes, 1992)						
Mammals (JH)	53	10	24%	0	2	7
Birds (JH)	122	12	23%	0	2	4
Woody Plants (CG)	474	130	27.4%	0	2	7
Freshwater Ecoregion (Cambray, 2002)						
Mammals (JH)	15	0	0%	0	0	1
Birds (JH)	139	2	4%	3	1	6

JH - James Harrison; GB - George Bredenkamp; CG - Coert Geldenhuys

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9.6 The Way forward

The study provided information on several ecological and tourism concepts. However, the opportunities for other research projects to flow from the project are a definite possibility. Batisse (1982) noted that the direct involvement of the local population in the management of Biosphere Reserves, together with the maintenance of research and monitoring activities in them, constitute the best guarantee for long-term conservation of genetic resources on a world-wide basis. Currently other research projects being done in the Biosphere Reserve include a project on the financial viability of tourism initiatives and other developments in the Biosphere Reserve, while another involves research on the participation of the local communities in the Biosphere Reserve as part of ecotourism. It is strongly recommended that a research team be formed in the Waterberg Biosphere Reserve to promote the Waterberg as a tourist destination, but also to ensure the preservation of its unspoiled status.

Definite opportunities sprouting from the study in the ecological field includes a syntaxonomic synthesis on the Mountain Bushveld of the Waterberg. This will not include the relevés of plant communities like wetlands and old fields as used in the study, but would be a formal detailed classification of the natural areas underlain by Waterberg Sandstone in the main Waterberg basin. Areas (e. g. Wonderkop Nature Reserve, Moepel Farms) where no information on the ecology (e. g. vegetation, ecosystems etc.) is available should be surveyed, to expand on the current database. Monitoring research programs on threatened plants, mammals and birds on reserves in the Biosphere Reserve could form an important part of conservation programs in the future. This plays an important role in preventing species loss, especially considering endemic plant species (e. g. *Vitex pooara, Combretum nelsonii*). Reyers (2002) suggested the following actions to curb the ebb of species loss in South Africa as management strategies:

- Integrate the protection and management of biodiversity resources and abiotic processes with all human development by means of regional and national conservation initiatives. Biosphere Reserves play an integral part in this aspect,

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and future planning of such areas in South Africa (e. g. Blyde-Kruger Canyons initiative) could promote the conservation of biodiversity even further.

- Build on existing programs to undertake biodiversity assessments and identify ecosystems, species and genetic resources that are at imminent risk of extinction. A proper ecological management plan implemented by the Waterberg Nature Conservancy, in conjunction with Limpopo Nature Conservation and Department of Environmental Affairs should be implemented.
- Initiate appropriate action to alleviate potential threats and develop early-warning systems. This aspect involves research monitoring programs on threatened species as mentioned above.
- Accelerate taxonomic knowledge of new species and genetic resources; and verify existing knowledge. The study forms the basis for specific in-depth studies on specific aspects named above could be done in future. The current study provides the basis on most updated existing knowledge.
- Build capacity in the area of threat assessment, taxonomy, technology development, knowledge transfer and appropriate technology. The ecotourism industry could play an important role in these aspects in the future, and other research projects could be initiated from them.

The opportunities for research and monitoring projects in the Biosphere Reserve are huge, especially considering the ecotourism potential of the area. However, the Waterberg cannot compare with the tourism "hotspots" of South Africa (e. g. Cape Town, Kruger National Park) and it should not attempt to do so, but should retain its own unique blend of wild country with its multi-cultural diversity catering for budget as well as international tourists.

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SUMMARY

The relevance of ecosystems to ecotourism in the Waterberg Biosphere Reserve

by

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The Waterberg area, Limpopo Province, South Africa, holds great potential as an ecotourist destination, especially considering the many conservation areas within the area. The promotion of these ecotourist destinations within the area can therefore not be underestimated. The newly declared Waterberg Biosphere Reserve has many conservation areas, preserving a high diversity of natural resources. The Reserve plays an important role in conservation and sustainable development. This study was performed to identify different aspects of ecosystems, which can enhance the potential of ecotourism within the area.

Twelve major plant communities were identified within the Biosphere Reserve. These plant communities formed the basis from which other analyses were performed, emphasizing the value of vegetation science in environmental planning and analysis. Tree and shrub species were analyzed as ecotourist attractions within the plant communities according to specific attributes they possess (e. g. medicinal, food source, uses). Six ecozones were identified as a mosaic of different plant communities within a homogenous landscape, and it is suggested that they should be incorporated as ecological management units as part of an ecological management plan for the Biosphere Reserve. These ecozones each include specific mammal or bird habitat types, of which the plant communities formed the basis for their identification. The vegetation structure and species composition of plant communities will often determine which mammal or bird species tourists can view while participating in ecotourist activities. The importance to conserve these habitats, especially of species

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listed as threatened species on the red data list, and the importance of monitoring projects for such species are emphasized in the study.

A tourism booklet providing tourists with information on the tourist attractions and ecotourist destinations within the Biosphere Reserve is planned, to promote the area as a tourist destination in the future. The study also provides the basis for many possible research projects in the ecological and ecotourism fields in the future.

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CURRICULUM VITAE

Barend Johannes Henning was born on 6 September 1976 in Pretoria, Gauteng. He attended Secunda Primary School in Secunda, Mpumalanga, and later Akasia High School in Pretoria, Gauteng, where he matriculated in 1994.

In 1995 he enrolled at the University of Pretoria, and was awarded his B.Sc. degree in 1997, with Entomology and Botany his majors. In 1998 he registered for an Honours degree in Botany at the same university and specialized in mycology. He obtained his degree at the end of that year. The following year (1999) he registered for his Masters degree in Botany at the same university, specializing in the field of soil science and agriculture. He completed his dissertation in 2000 entitled "The agricultural recycling of sewage sludge for maize and oats cultivation".

However, it was his dedication towards nature that motivated him to register for a Doctoral of Philosophy Degree, specializing in plant ecology, at the same university in 2001. He completed the dissertation entitled "The relevance of ecosystems to ecotourism in the Waterberg Biosphere Reserve" in 2002. His work was presented at a local and international conference. A popular tourism booklet and several publications are being planned for future publication.

He is currently working as a free-lance tourist guide throughout South Africa, and plans to work for a period of two years at a private game reserve in the lowveld, Mpumalanga as a ranger guide, after which he plans to start a tourism business venture.